1
E4892Ef

CONSERVATION, WISE USE AND DEVELOPMENT OF NATURAL RESOURCES

LIBRARY
CURRENT SERIAL RECORD
★ JUL 8 - 1959 ★
U. S. DEPARTMENT OF AGRICULTURE

EXTENSION SERVICE Review
JUNE 1959

30/6

EXTENSION SERVICE Review

Official monthly publication of Cooperative Extension Service: U. S. Department of Agriculture and State Land-Grant Colleges and Universities cooperating.

The Extension Service Review is for Extension educators in County, State and Federal Extension agencies—who work directly or indirectly to help people learn how to use the newest findings in agriculture and home economics research to bring about a more abundant life for themselves and their community.

The Review offers the Extension worker, in his role of educational leader, professional guideposts, new routes, and tools for speedier, more successful endeavor. Through this exchange of methods, tried and found successful by Extension agents, the Review serves as a source of ideas and useful information on how to reach people and thus help them utilize more fully their own resources, to farm more efficiently, and to make their home and community a better place to live.

Vol. 30 **June 1959** **No.**

Prepared in
Division of Information Programs
Federal Extension Service, USDA
Washington 25, D.C.

Division Director: *Elmer B. Winner*

Editor: *Edward H. Roche*

In This Issue

Page

123 Our responsibility to natural resources
124 The potential in farm woodlands
125 Adding up our soil assets
126 Managing the public domain
127 Meeting tomorrow's fish and wildlife needs
128 Coping with the urban sprawl
129 Giving land a future
130 The Brandywine—a watershed at work
132 The fishpond boom
133 What lies ahead for Alaska's homesteaders
135 Fitting conservation into the picture
136 Step-by-step to soils education
137 Blueprint for the future
139 The team approach to forage education
140 Conservation comes to the city
141 Range management is on the up-swing
143 Monthly revisions in publications inventory
144 Six steps up and twice as high!

EAR TO THE GROUND

"God Almighty is making more folks every day. But He's not making any more land." That remark was made many years ago by T. B. Parker, one of the original owners of Progressive Farmer magazine. It's just as true today.

A county agent visiting Washington, D. C. recently saw dramatic proof of this. Sherman Weiss of Sawyer County, Wis., one of 20 extension workers here to receive USDA Superior Service Awards, stopped by the Department of Commerce to visit a friend.

In the lobby, Sherman saw the Census Clock, an electric chart which records births, deaths, immigrants, emigrants, and net increase in our population. He visited his friend, then checked the Census Clock again before leaving. In the 20 minutes he was in the building, the U. S. population increased more than 100 persons.

The Census Clock records a net increase in population of 1 person every 11 seconds. If you slept 8 hours last night, the population was more than 2,600 persons greater when you awoke. And the same increase occurs around the clock, every day in the year.

No further proof should be needed that we all have a stake in conservation, wise use, and development of natural resources. As the Soil Conservation Report points out, "The Extension Service has both a unique opportunity and a responsibility to help develop a realistic appreciation of the necessity for and practical value of the wise and non-depleting uses of such resources."

Throughout this special issue you'll note one underlying thought—the inescapable relation between human and natural resources. This thought is well expressed in another statement I read recently:

"Life has been considered cheap and expendable by nations which have suffered extreme resource deterioration such as China—which never discovered the relationship between man and his environment. In other places, other times, and in other ways the human race has paid the price of this lack of understanding.

"Conservation, in its broadest sense, means living in harmony with nature. Man cannot escape his environment. He may live out of harmony with it as they have in China, or he can develop essential knowledge and a sense of conservation. The issue is that simple."—EHR

The Extension Service Review is published monthly by direction of the Secretary of Agriculture as administrative information required for the proper transaction of the public business. The printing of this publication has been approved by the Bureau of the Budget (June 26, 1958).

The Review is issued free by law to workers engaged in extension activities. Others may obtain copies from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 15 cents per copy or by subscription at $1.50 a year, domestic, and $2.25, foreign.

OUR RESPONSIBILITY to NATURAL RESOURCES

by E. W. JANIKE, *Associate Extension Director, Nebraska*

CONSERVATION, development, and wise use of natural resources is everybody's business.

The way we think about resources depends on where we live, how we earn our living, and the expediency of our immediate needs. To one person a stream is a place to fish and boat. To others it is a source of water for irrigation, domestic, and industrial use.

Most people who live in cities probably think of natural resources as a place to fish, hunt, and take a vacation. Rural people think of natural resources as something usable for producing the food and fiber needed to maintain their own families and those who live in the cities.

We in Extension accept as a general principle that our educational responsibilities are first to farm families, but not to them alone. Farm families are closest to our natural resources and are more conscious of their value and expendability. We, as extension workers, probably think more in line with the interest of those who use natural resources as a means of livelihood.

Because we work in the agricultural field, we too are close to soil, water, minerals, forest, grassland, cropland, fishing, and wildlife. We recognize that natural resources are expendable and that some are irreplaceable.

The Changing Scene

The total cropland acreage has changed little since 1920. New cropland has been developed through drainage, clearing, irrigating arid land, and plowing up native grass. However, land is being lost to highways, industrial growth, urban development, erosion, military establishments, and other uses. Forty-five years ago there were 3.55 acres of cropland per capita. Today there are no more than 2 acres per person.

Water use is mounting. Per capita domestic use is 145 gallons daily. Total use for domestic, agricultural, and industrial purposes is about 1,300 gallons daily per person.

Even though per capita use of lumber has decreased 50 percent since 1900, total consumption has increased. Hunting and fishing permits increased 2½ times in a 15-year period. Minerals once used are irreplaceable.

Look at some of our neighbors across the ocean and see what can happen to natural resources and their relation to food and fiber needs in supporting a growing population. We face some of the same problems of increasing population and natural resource needs.

Most of us have enough confidence in research and human nature to feel that we can avoid the hardships and resource deteriorations that have occurred in some of these countries. However, the problem does not simplify with time. It becomes more

(See Our Responsibility, page 142)

The Potential in Farm Woodlands

by W. S. SWINGLER, *Assistant Chief, U. S. Forest Service*

RECENTLY a county extension agent told me that a farmer had asked him to look over some pasture improvement work. As they walked across the fields, the agent glanced at the patch of woods in one corner of the farm and asked the owner, "What plans do you have for your woodland?"

The question surprised the owner. He replied, "Plans? I don't know as I've given my woods that much thought. I suppose I'll be cutting some timber soon."

About three weeks later the farmer came to the agent's office. He said he'd been thinking about his woods since the agent's visit. He'd looked over his woods and wondered how to go about getting a woods plan.

That was easy for the agent. All he had to do was to get in touch with the local forester. The forester and the owner made an inventory of the woods. Then, with the needs of the farmer in mind, the forester made an easy-to-follow management plan for the woodland.

"The important part of this story," the agent said, "is that the woodland is now a full producing part of the farm operation."

I like the emphasis that he gave the words, "full producing part of the farm operation." Therein lies one of the best opportunities at the finger tips of our farm woodland owners today.

Total Timber Picture

This small forest ownership situation is typical of many throughout the country. In order to get a clearer picture of the total situation, let's take a quick look at the Timber Resource Review (TRR).

In January 1958, the Forest Service, U. S. Department of Agriculture, issued a report, Timber Resources for America's Future. Secretary of Agriculture Benson called it "The most complete appraisal of the timber situation ever made in this country."

It reveals that there are 3.4 million farm woodlands containing 165 million acres of timber which could and should be made a "full producing part of the farm operation." In addition 1.1 million small, nonfarm forests need early forestry attenti

More specifically, the TRR sho that most of the land owned forest industries and public agenc is left in reasonably good growi condition after cutting. But on m than half of the recently cut fa woodlands and other small priva forests, conditions for future grow are far from good.

These small forest ownersh have the greatest wood-produci potential in America and are usua the most accessible. But they only growing one-half or less of t quality premium-priced timber t they could grow with a boost fr scientific forest management.

In many places the trees that monopolizing some of the choic timber growing land are not the b species. And frequently where th are good trees, they are too few number and often cut before th reach the most profitable size.

Small woodlands comprise e half the commercial forest land the United States. Obviously, wh considering goals for future tim needs, we cannot ignore 50 perce of our forest land. And these pr erties are now producing far bel their capacity.

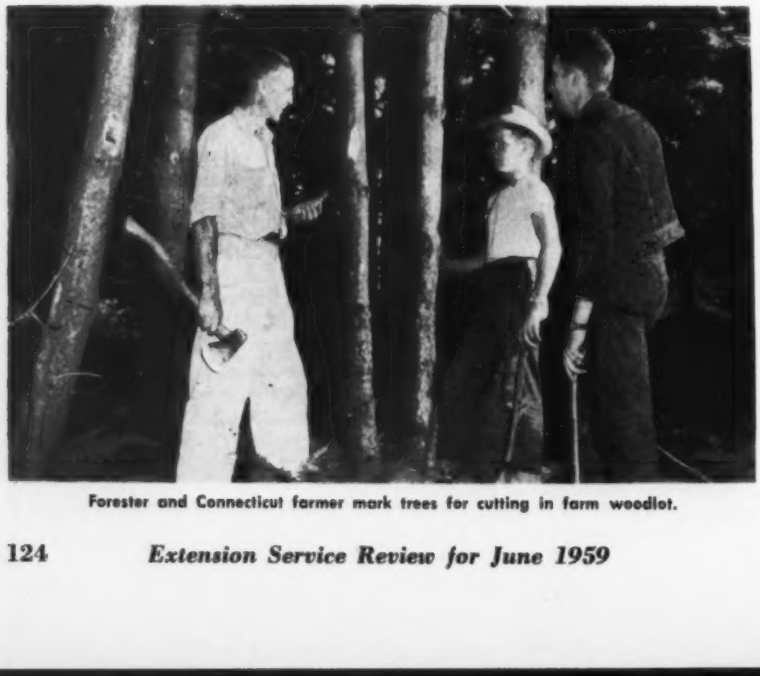
Timber and the Future

To insure our growing populati with timber—there will be 100 m lion more people by the year 200 we will need to double the sawtimb growth on these lands. We've g to step it up from an average ann growth of 97 board feet per acre at least 195 board feet. The bigg job is to step up softwood growth about three times.

In talking about America's sm forests, I am not thinking in ter of land and trees for the sake of j growing trees. I am thinking of t benefits woodlands bring—watersh protection, wildlife, soil stabilizati and a tranquil place for outdoor r reation—to name a few. I am thi ing also about the hundreds new forest industries that doub sawtimber growth could support a the thousands of new jobs and n landowner income that it co create.

Extension workers know that t

(See Farm Woodlands, page 134)



Forester and Connecticut farmer mark trees for cutting in farm woodlot.

ADDING UP OUR soil assets

by GEORGE ENFIELD, *Federal Extension Service*

WE'RE so rich we don't know how much we're worth. That might describe the soil situation in our country.

Some people may contend we've been so busy we never took time to add up our soil assets. Probably others would say our wealth changes from year to year so what's the use of fussing about it anyway.

In 1956 Secretary of Agriculture Ezra Taft Benson decided to find out the present condition and use of one of our greatest resources—the soil. He issued a memorandum implementing a National Inventory of Soil and Water Conservation Needs. It includes two major types of estimates: (1) an inventory of land use, conservation problems, and acreage needing treatment; and (2) an inventory of watershed project needs.

The inventory of land use and conservation problems includes all land except Federal noncrop land, while the watershed project inventory includes all lands without respect to ownership. The Department of Agriculture is encouraging cooperation of agencies responsible for Federally-owned land management in developing data for the National Inventory.

A departmental committee composed of representatives from eight agencies developed a procedure for the inventory. States and counties expect to finish their part of work by January 1, 1960. Review of the data, compilation, and summary of the results will be completed shortly after the first of the year.

Survey Steps

The first step is to survey the present soil situation. It would be impossible, of course, to complete a detailed survey for the entire country in less than 3 years. So a statistical sampling procedure is being used. Findings are being expanded to give a reasonably accurate estimate for each county.

The results provide county people with an estimate of their present soil resources according to: (1) soil type, (2) slope, (3) existing degree of erosion, and (4) present land use.

Each county committee is composed of representatives from all agricultural agencies within the county and others interested in soil and water conservation. The committee compares data obtained from the expanded soil survey with other land use records such as agricultural census reports, agricultural experiment stations, forest surveys, ASC records, assessor reports, and others. Then they adjust the estimates, if necessary, to comply with adopted land use.

Soil information is grouped into land capability units and then subdivided according to present use such as: (1) cropland, (2) pasture and range, (3) forest and woodland, and (4) others. Then the local committee predicts the land use pattern for their county in 1975.

Next the county committee estimates how much acreage needs treatment to conserve soil and water resources. These estimates are made for the expected land use.

The inventory of watershed project needs will provide a basis for classification and appraisal of needs of the nation's small watersheds.

This inventory will provide a reasonably accurate record of our present net worth in soil resources. This should make it possible to calculate the productive capacity of our agricultural plant. From our present output, we can estimate our efficiency. Such an estimate can do many things. It may eliminate the fear that our rapid rise in population is about to eat us into a food shortage. It should show the areas that are in the greatest need for soil and water conservation.

The inventory may direct attention to needed research for anticipated land use pattern in 1975. A survey of this nature could help select sites for the expansion of food production that requires specific soil and climatic conditions.

This information should help direct agency programs concerned with soil and water resources. The estimates will give a basis for comparing county needs, projected possibilities, and a starting point from which accomplishments and trends can be measured.

Projecting Land Use

Before this survey, we estimated progress by what had been done rather than measuring the direction we were going. The land use trend was measured by looking backward on what we thought the conditions must have been. The rapidity of change was not well-known because we had failed to establish accurate benchmarks or dates of observations from which deviations could be measured.

We hear much about expected land use, yet this is the first time we have established a base line to measure these changes for the nation. Some counties have been carefully sur-

(See Soil Assets, page 142)

MANAGING THE PUBLIC DOMAIN

by BUREAU OF LAND MANAGEMENT, *Department of the Interior*

Development of water on arid ranges is an important part of BLM's range improvement program.

THE Bureau of Land Management —BLM as it is generally called —is responsible for the conservation, management and development of a large amount of land and natural resources. Altogether the Department of the Interior's BLM manages about 475 million acres, an area nearly 10 times the size of New England. About 299 million acres of this total are in Alaska.

This is the public domain—land that belongs to all of the people. Once it included more than 1.8 billion acres—all of the land west of the Mississippi River (except Texas) plus Florida, Alabama, Mississippi, Ohio, Indiana, Illinois, Michigan, Wisconsin, and Minnesota. Most of the public lands now are located in the 12 Western States and Alaska.

Extent of Responsibilities

The job of managing the Nation's public lands and resources is big and complex. It deals with the land itself, minerals (including oil and gas), forests and timber, and range grasses. To do its work, the Bureau divides the jobs among five main programs.

One important program is the public land survey. These surveys are basic to acquisition and use of public lands and provide legal land descriptions for ownership and title purposes. Throughout the public land States is spread a network of townships, ranges, and sections—a surveyed patchwork quilt of property lines.

In years past this survey work was done by men on foot. Today the Bureau uses helicopters to transport crews to and from remote, rugged work areas. The Bureau is also making use of the latest electronic distance measuring devices and studying the feasibility of aerial photographic survey methods.

The basic element of natural resource administration is, of course, land. And basic to the programs and operations of BLM is the administration of the public land laws. Under these laws, over a billion acres of public domain lands have been transferred to private ownership and local governments.

Special Legislation

Many different kinds of laws apply to the public lands. Some, such as the homestead and desert land laws, provide a means for the transfer of public lands to private citizens for farms and homes. Others provide for the public sale of certain lands to individuals. One law authorizes the lease or sale of small tracts for business, recreational, or residence sites.

Laws also provide for the leasing or transfer to private ownership of mineral lands. And another authorizes States, local governments, and nonprofit organizations to obtain lands for recreational and other public purposes. There is also authority for the withdrawal of certain lands from all forms of public entry and appropriation—for defense purposes, wildlife areas, and other management uses.

As a part of its lands function, the Bureau maintains basic land records —documents which are the source of original title for more than 1.8 billion acres of private and public lands. These records date back to colonial times.

The Bureau is responsible for a forestry program on a broad scope. BLM administers more than 161 million acres of forest and woodlands in continental United States and Alaska. These consist of about 46 million acres in commercial types of forest lands and 115 million acres classified as woodlands.

Selling mature timber under good forest management practices, embodying the principles of sustained yield, fire prevention and suppression, forest disease and insect control, and access road construction are all parts of the BLM forestry program.

Another major program of the Bureau is administration of the mining and mineral leasing laws. The Bureau issues competitive and noncompetitive leases for oil, gas, phosphate, and other minerals, and grants patents to lands located under the General Mining Laws.

Bureau range managers and technicians work with programs to conserve water and other resources in the management of western rangelands, to provide browse for wildlife, and forage for the production of meat, wool, and leather. They issue permits in grazing districts and grazing leases on public lands outside of these districts.

In carrying out an active program of rehabilitating depleted rangelands

(See Public Domain, page 138)

Meeting Tomorrow's Fish and Wildlife Needs

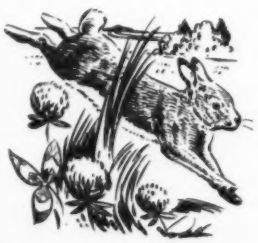
by ARNIE J. SUOMELA, *Commissioner, Fish and Wildlife Service, U. S. Department of the Interior*

In the Fish and Wildlife Service of the Department of the Interior, the accent today is on program planning to meet tomorrow's fish and wildlife needs. These needs of the future are being created by the rapid growth of our country. Our population is expanding explosively—200 million expected by 1970 and at least 300 million by the turn of the century. In terms of recreation dependent upon fish and wildlife, more people mean greater needs and larger demands on our resources.

One thing we know for certain—there will never be any more habitat available for fish and wildlife production than we have today. And with the explosive increase in our population, the simple fact is there will be considerably less.

Wildlife resource conservation must meet this threat of shrinking natural habitat. This is not a problem still in the future. It is already with us.

Our future programs must be based on the fact that all resources —soil, water, forest, fish and wildlife—are interrelated and interdependent. We must tie the management of fish and wildlife resources to a balanced use of soil and water.



The biggest single need is to find ways to increase fish and wildlife production per unit of environment. We must follow the pattern agriculture already has pursued in this respect. Our sights will have to be raised constantly as the numbers of people mount and their requirements for food and recreation increase.

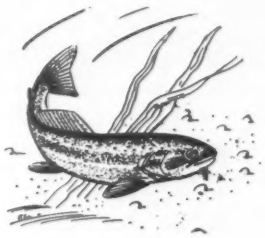
The first step is to develop the techniques. The second is to get them implemented on a broad basis in terms of the acreage required to meet the demands for the product. The former involves research; the latter, management.

Research must be expanded and coordinated. States look to the Service to coordinate research efforts on resident wildlife and sport fisheries. We facilitate exchange of information from various studies and suggest patterns of research in governmental agencies, universities, and private foundations. This helps eliminate duplication and encourages the use of special talents on the right tasks.

In management, as in research, the Service's two Bureaus (Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife) promote the exchange of information on management techniques and devices. This applies both to resident fish and wildlife, for which the States are responsible, as well as for migratory birds, the responsibility of the Federal government.

The Bureau of Sport Fisheries and Wildlife has another important management responsibility in planning for the future. It makes certain that adequate plans are incorporated in Federal financed or licensed water development projects, not only to relieve any fish and wildlife losses but to enhance such values.

In capsule form, the future program of the Bureau of Commercial Fisheries seeks to maintain fisheries at the point of maximum sustained yield with peak efficiency for the fisherman's effort. And the Bureau wants to assure that the consumer obtains the highest quality fishery product that nature and science can provide.



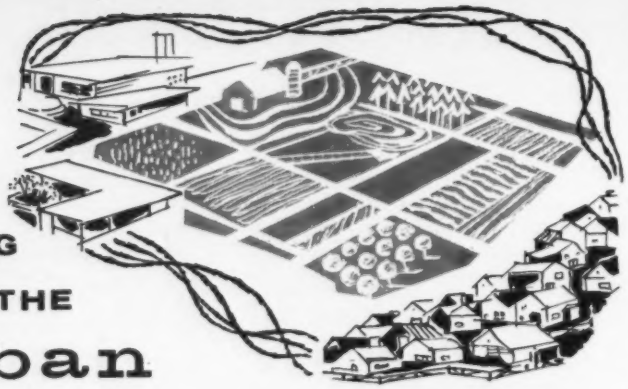
In program planning we find many instances where commercial and sport problems and responsibilities are joined.

For example, swift inroads are being made on irreplaceable habitat for both commercial and recreational resources. Real estate developments in coastal marshes, intracoastal canals, big ship canals and other such projects threaten spawning and rearing habitat for commercial and sport fishes, wintering grounds for migratory waterfowl, and year-round habitat for many valuable furbearing animals. Our job is to devise ways of protecting these resources without hampering needed industrial or agricultural development.

Another matter of joint concern is the use of insecticides and herbicides which not only kill pests but take a terrific toll of fish and wildlife. Our intention is not to sacrifice the farmers' crops to the grasshopper and other insects but to help develop formulae and procedures which will do the job for the farmer without injury to fish and wildlife.

An essential characteristic of our resource program for tomorrow—if we are to keep pace with the future—is a greater partnership effort among Federal departments and between the Federal government and the States. Again, the importance of a

(See Fish and Wildlife, page 138)



COPING WITH THE urban SPRAWL

by W. B. WOOD, *Extension Director, Ohio*

URBANIZATION is the order of the day. Across the nation, cities are sprawling farther and farther into the country with their overflow of people.

Many States are experiencing population booms, among them Ohio. There are nearly 1.5 million more citizens in the State now than in 1950. If the trends continue, Ohio's population will swell from 10 million at present to between 12 and 13 million by 1975.

Industry is pushing out too, as big factories spring up in rural areas. These industrial plants look to both rural and urban residents to fill their payrolls.

What will this rapid urbanization do to people and to the environment in which they live? What will be its impact on conservation, development, and use of natural resources? Certainly we can expect to face such problems as increased industrial and domestic needs for water, new concepts in proper land use, greater need for recreational facilities, sewage disposal, and protection against stream pollution.

But in a larger sense, we face the need for establishing a basic policy to govern our natural resources. The future strength and security of our nation and its people require determination of such policies, plus the application of action programs which will provide sound management of resources for the good of all.

These problems are in the public interest and must be considered by all the people. Extension's role is one of setting the stage for thorough discussion of the problems involved, providing information on which sound judgments can be based, and assisting in arriving at a course of action to meet future needs.

We do not expect this course of action to be smooth or without turns or detours. Frankly, we cannot envision all of the turns that this course may follow, or even the exact spot to which it will eventually take us. This does not mean, however, that we cannot or should not begin to equip ourselves with the educational skills we shall need when we are called on to help people decide which road to take.

Changing Audience

Urbanization is bringing rapid changes in the cooperator clientele of many county agents, particularly in metropolitan counties. In some areas, agents are working on such problems as rural zoning, water supply, drainage, and sewage disposal. People are asking questions about lawn care, garden and backyard fruit culture, and insect control.

The county agent suddenly finds that he is serving a new group of people, a different audience, with vastly different interests. His clientele becomes one far more interested in crabgrass control than in mastitis control. The farms the agent visited and knew so well are gone. In their places stand industrial plants and housing developments.

In such rapidly changing communities, the Extension agent who serves best will be the one who is able to shift emphasis to meet the needs of his clientele.

In Ohio we believe Extension has a responsibility to work with other agricultural interests in developing an adequate policy governing the water, soil, forest, and other natural resources to cope with rapidly changing conditions. We know from experience that county agronomy and conservation committees, either organized separately or in conjunction with the local soil conservation district, are both feasible and practical in developing an extension educational action program.

Farming practices influence the quantity and quality of water available for agricultural purposes as well as for domestic, recreational, and industrial uses. We know today that one-half the total water consumed in the United States is for irrigation, although only 7 percent of the land area is involved. Conservation authorities estimate that in a State expanding rapidly, industry and agriculture water requirements will double within the next 10 years.

We can expect urbanization to increase our needs for outdoor recreational facilities. With shorter work weeks and improved transportation people are spending more time in the country. This means we shall need to make maximum use of our lakes, streams, forests, parks, and other outdoor recreational facilities, and perhaps consider the development of additional ones.

Modern housing creates problems in land use, too. The trend is away from apartments and toward single unit dwellings. Single units occupy more land, taking additional acreage out of production. As these units mushroom side by side and row on row, they bring quickly into focus problems in zoning, sewage disposal, school and recreational facilities.

Such mushrooming communities need a means of carrying out long-range township or county plans to

(See Urban Sprawl, page 143)

Giving Land a Future

by J. E. LAWRENCE, *TV Specialist, New York*

Editor's Note: The author was formerly associate county agricultural agent in Broome County, N. Y.

Typical pond on a rural nonfarm property which was once a run-down, abandoned farm.

SIXTY-TWO percent of your county is submarginal—economically unsuited for full-time commercial farming. Rural nonfarm residents, part-time farmers, absentee landowners, city dwellers, civic and social groups, business and industrial interests, and commercial farmers are involved in the complex social and economic problems arising from this vast out-of-farming area.

Extension is called on to launch an educational program to help these folks turn an obvious land liability into a tangible asset designed for wholesome, harmonious rural living.

I found myself in this challenging situation 4½ years ago when given the opportunity to participate in this different approach to the total rural scene. In this case, it is an approach that concentrates largely on the conservation, development, and wise use of natural resources.

Specifically, it involves the sound and profitable use of low-income farmland. It is a program based not entirely on what people can do for this land, but more on what the land can do for the people.

Site of this pioneering project is Broome County, N. Y. A 700-square mile area along the New York-Pennsylvania border, Broome County is typical of the rapid rural changes taking place through both States' "tier" counties.

A hill and valley topography reflects wide variations in the land's suitability for profitable agriculture, mainly dairy. Improved farming methods advance the competitive position of better lands. High urban populations, with easy access to rural areas, are an inexhaustible reservoir for settlement of the fringe and beyond by city-working, country-living residents.

Against this backdrop, the commercial farmers responsible for the county's agricultural extension program teamed up with civic, business, and industrial interests to examine the many problems involving abandoned farmland. Out of this study came a blueprint for action—the committee's report known as, Land of the Future. This document spells out specific recommendations for the fuller utilization of once productive farms.

So, what is the future of this land?

This is precisely the question farm and city leaders asked as they shaped Extension's new land-use program. They were given part of the answer when they called on a number of county, State, and Federal agencies for advice and counsel. These agencies supplied valuable information pointing the way to a practical solution to the wise use of submarginal land.

(See Future for Land, page 134)

Exhibits help acquaint people with the program, enlist their support, and let them know that someone is interested in their problems.

Local leaders and members of College of Agriculture advisory committee learn about a farmer's land use plans.

The Brandywine—
A Watershed at Work

by CLAYTON M. HOFF, *Executive Vice-President, Brandywine Valley Association, Wilmington, Del.*

THIS is a story of a valley, the Brandywine Valley, and how the people there have worked together to make it a better place in which to live, work, and play.

The Valley is not large, only 330 square miles. It is not heavily populated, only about 200,000 inhabitants. But it has been important in the industrial and political history of our country and it may earn another spot in history for its accomplishments in conservation of natural resources.

It all began back in March 1945 when 35 interested citizens of the Valley met to discuss their major natural resource problems. They viewed slides depicting the severity of their problems: stream pollution; decrease in crop yields and lower fertility of farmland, due to soil erosion; damage to forest through improper lumbering, pasturing of woodlots, and fires; diminishing game and wildlife; and sacrifice of fishing and other forms of recreation, due to polluted and flooded streams.

When the group saw how these things were affecting not only their welfare, but their health as well, they decided to act. They voted then and there to form an organization to study and solve these problems.

That's how the Brandywine Valley Association, Inc. was formed. It was incorporated as a private, non-profit, educational organization, with the objectives of restoring, serving, and improving all natural assets of the Brandywine Watershed.

A basic conception was that a watershed is a logical unit to work on the conservation of natural resources. The people of a watershed have more in common than in a politically bounded unit.

Then, too, the organizing group believed that it was the responsibility of the local people to initiate and prosecute their own program of conservation. While accepting local responsibility, however, they did not overlook the advantages and took every step to secure the assistance of all available local, State and Federal agencies, particularly with respect to technical help. They diligently avoided competing with an existing agency. On the other hand, where a needed agency did not exist, they took steps to create one.

Another basic principle was that work should be done simultaneously on all problems and all resources. They also believed in securing the financial assistance of all interests in the Valley and carrying out a program which would provide the maximum benefits to all interests.

Educational Methods

Broadly interpreted, the Association's educational work covers research or fact-finding, public information, promotion, and encouraging cooperation between various agencies in the watershed. The following are projects classified as research or fact-finding.

- Measuring rainfall, discharge, and silt content of the Brandywine through a cooperative agreement with the U. S. Geological Survey.
- Determining the cumulative effects of pollution by a limnological survey of the Brandywine waters, through an agreement with the Academy of Natural Sciences of Philadelphia, Pa.
- Measuring the amount of topsoil or the degree of erosion with the help of Extension and the Soil Conservation Service. Securing a comprehensive water and land use survey of the entire Valley through the help of the Soil Conservation Service.

In the educational field, the Association uses all media to inform people in the watershed of the problems, remedies, activities, and progress. Illustrated talks have been presented to audiences of over 700,000.

A 27-minute, 16mm. sound color film, The Brandywine—A Watershed At Work, was prepared with the assistance of the State Departments of Forests and Waters, and Agriculture, and the motion picture laboratory of Pennsylvania State University. Thirteen prints of this film, distributed both by the Association and the Department of Forests and Waters, have enabled hundreds of organizations and thousands of people in and out of the watershed to study this program.

The Association, for most of its lifetime, has participated in one conservation workshop for teachers and has instigated the formation of two more. These workshops provide opportunity for over 100 teachers each year to study the conservation of natural resources in the field and to equip themselves for teaching it.

Hundreds of conservation tours have been conducted by Association staff members for teachers, schools, social clubs, service clubs, civic organizations, educational, and other groups.

Another important educational project was the Gregory Farm Demonstration, planned in cooperation with Extension and the local Soil Conservation District. This rather comprehensive face-lifting program on a farm was witnessed by over 10,000 people. Similarly, a sanitary landfill demonstration was arranged, in cooperation with four townships, so that hundreds of people could see and study the various new methods of rubbish and garbage disposal.

The WATERSHED NEWS, a quarterly, and other publications are sent to the 2,000 members of the Association. The staff conducts regular radio broadcasts and arranges telecasts to cover interesting events.

Sensing that little progress could be made on reduction of pollution in Delaware without a pure stream law, steps were taken to prepare a Pure Stream Bill for Delaware. The A

County agent and district supervisors talk over farm conservation measures as part of Brandywine watershed improvement program.

Great blue heron, a rare sight until recently, and mallard ducks are part of wildlife and game improvements in Brandywine Valley.

sociation backed its passage by the legislature and since has cooperated with the Water Pollution Commission of Delaware and the Sanitary Water Board of Pennsylvania on the reduction of pollution from industrial and sewage waste.

To improve the harvest of farm woodlots in the Brandywine Valley, the Association promoted the organization of a cooperative sawmill and a consulting service for better harvesting and utilization of farm forest products.

To study present and future needs of water supplies in the Valley, the Association organized the Brandywine Water Resources Committee. The committee, which consists of the major water users of the Valley, directed a survey of the present and future water needs, water now available, and the means for reconciling the two.

Some Results

A rather comprehensive evaluation of results was made after the first 10-year period of the Association's existence. They show that for the Valley, as of October 1955, over 55 percent of the farms were under conservation plans with Soil Conservation Districts and 70 percent of the farms were under good conservation practices. Over 20,000 acres were in contour strips and some 18,000 acres converted to grassland farming.

Conservation activities included over 13 miles of diversion terraces and 145 new farm ponds. Runoff has been reduced by about 30 percent as measured by our series of rain gage, flow gage, and silt sample stations, and there has been more than 60 percent reduction in silt discharge.

Over 2,200 acres of woodlots were harvested under the supervision of a farm forester and over 1½ million trees planted in reforestation projects.

Game and wildlife have increased due to a decrease in pasturing of forests, burning of woodlots and grass, and also because over 21 miles of multiflora rose living fences have been planted.

Since creation of the Delaware Water Pollution Commission, progress has been rapid in the reduction of pollution. The city of Wilmington has spent $18 million on a sewage reduction plant and other communities have spent another $4 million on improving plant facilities. Industries, likewise, have spent over $1.1 million on waste disposal equipment.

The net result is that the Valley has equipment for handling about 95 percent of the sewage and industrial waste.

This means, of course, that fishing is rapidly getting better in the Brandywine, not to mention additional fishing in the farm ponds. And other facilities for recreation are rapidly improving. The Brandywine is now classified as a satisfactory source of domestic water.

About the time of this 1955 progress report, a big change occurred in the Association's major activities. It was precipitated by 2 years of severe drought followed by severe flood damage.

Feast or Famine

During the drought, industries were forced to curtail production, citizens were requested to refrain from non-essential use of water, and many farmers resorted to supplemental irrigation, thus decreasing the level of water in wells and the flow in streams. Following these periods, there were torrential rains, resulting in terrific flood damage to industry, community, and agricultural land, not to mention highways, utilities, and water supplies.

The extremes of these conditions are illustrated by the flow measurements at the dam at the Wilmington water supply intake. For several days the flow of the Brandywine was below 38 million gallons per day, of which industry consumed 5 million (normal consumption 15 million gallons per day) and the city of Wilmington 33 million gallons, leaving not a trickle flowing over the dam. Then came the cloudburst and enough water went over this same dam in 2½ days, approximately 10 billion gallons, to last Wilmington for almost a year.

The simple answer was to save

(See The Brandywine, page 134)

THE FISHPOND BOOM

by EARL F. KENNAMER, *Fish and Wildlife Specialist, Alabama*

FROM a few thousand weed-choked "fishless" potholes to 2½ million productive units is the saga of the artificial pond.

The productive fishponds we have today stemmed from experimental work by the Alabama Polytechnic Institute Agricultural Experiment Station in the 30's. Since that decade, the landscape has become dotted with private ponds.

No one can provide an accurate number of farm fishponds because they are being constructed by the thousands at this moment. In Alabama alone, the 16,565 farm ponds have a surface acreage almost equal to the acreage of all streams and rivers in the State!

The primary purpose for a pond may be water for home use in areas of limited rainfall, livestock water, or a reservoir for irrigation. At the same time, no owner should overlook the feasibility of stocking his pond with fish.

In many cases the pond serves as a source of additional income. Thousands of Alabama landowners construct and manage what I call "pay" ponds. These generally provide an income of $50 to $300 per acre annually.

One Alabama farmer has three ponds totaling 10 acres open to the public. In 1957 he realized $4,800 from sale of daily fishing permits. Pay ponds in the State last year grossed $642,795.

Ponds have other values besides recreational, agricultural, and cash income. A 2 to 3-acre pond will supply 150 to 600 pounds of edible fish annually. Privately owned artificial ponds in the nation today could supply at least 125 million pounds of food fish in an emergency.

What are the basic problems confronting extension fish and wildlife specialists (now classified in full-time capacity in 13 States) and county agents in regard to private fishponds?

Location and Construction: In many locations, ponds should not be built because of terrain, soil type, contamination, and other factors. There is danger of excessive water seepage in sandy or limestone areas.

In the earlier days of pond construction, we recommended a 1-acre pond for a farm family. This is still generally true if you exclude all "fisherman friends." Even ponds smaller than 1 acre are good producers with careful management. But most landowners, whenever possible and economical, should figure on a 3 to 5-acre pond.

Stocking and Balance: Many pondowners want to "experiment" with various species of fish or stock too many fish of approved species. In such instances, the ponds become sterile producers.

Often the forage fish species—bluegills, shellcrackers—become crowded and must be reduced in numbers and bass added. I usually recommend that ponds with too many fish of undesirable species be drained and restocked.

Weed Control: Possibly the most pressing problem is the prevention and control of weeds. Most ponds in time become infested with vegetative growth.

Prevention by deepening the edges and following a good fertilization program is a basic theme. When ponds become crowded with plant growth, it is the specialist's and the county agent's job to determine the most economical chemical or mechanical control program.

At times the situation calls for a partial solution. For example, one pond of around 50 acres was thoroughly clogged with *Elodea*. Eradication of the weed would have been a banker's nightmare. At my suggestion, "fishing channels" were developed by application of sodium arsenite. The owner then had limited fishing areas with a minimum of expense.

Muddy water, excessive seepage, diversion of heavy overflow, bird and mammal pests, and acid and alkaline water pose other problems for the pondowner and the extension worker.

What of the future? The prediction is continued construction of new ponds.

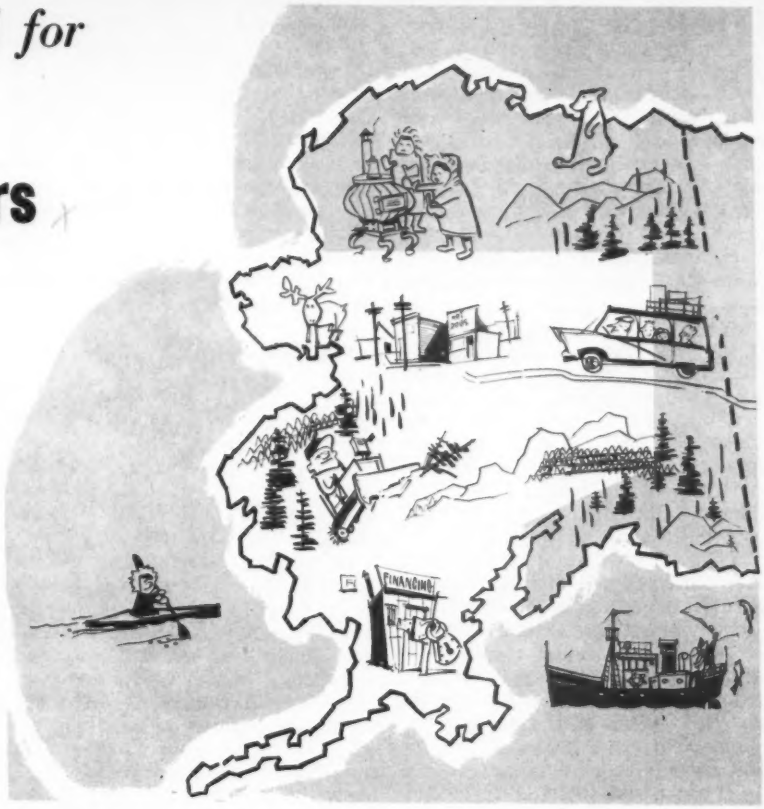
There's no doubt about it—the farm fishpond is here to stay!

Weed infestations such as this are a constant problem to pondowners.

The same pond gets an approving look four weeks after treatment

What Lies Ahead for Alaska's Homesteaders

by JAMES W. MATTHEWS, *Fairbanks District Extension Agent, Alaska*



HOMESTEADING! The prospect of staking out a land claim in Alaska excites the imagination of a lot of people. They see this as an opportunity to get started in farming on "free" land.

But advising everyone interested in farming in Alaska to do so posthaste is somewhat like advising everyone interested in operating a drugstore, sawmill, or grocery store to come to the new State. Certain limitations apply to all of these operations—market limitations, training, physical and financial resources, capital requirements of establishing a new business in an area quite different climatically, sociologically and geographically than most States.

Many new and unusual problems face persons establishing a farm in Alaska. It is not possible to treat all of them in a single article. Discussion of some major problems, however, may help extension workers in advising persons interested in agricultural possibilities of Alaska.

Alaska is the only State which offers unlimited homesteading opportunities. Every male citizen of the U. S. over 21, or female over 21 who is head of a household, qualifies for homestead entry provisions on 160 acres. But this is not free land. A minimum of one-eighth of the acreage must be cleared and meet cultural requirements to be eligible for title.

Land clearing costs range from $100 to $125 an acre in the Fairbanks (interior) area to as high as $200 an acre in the Matanuska Valley and heavily timbered areas on the coast. Minimum cleared acreages to allow adequate rotation and good crop production range from 50 acres for vegetables to 100 acres for dairying and less intensive farm enterprises.

Farming Enterprises

Dairying, potato, and small vegetable production have been the most successful and stable farm enterprises.

A 1957-58 survey of 18 dairies in the Matanuska Valley indicated an average capital investment of $57,479 in land, buildings, machinery, livestock, crops, feed, seed, and fertilizer. Milk production per cow averaged 10,000 pounds. Cost of production per 100 lbs. of milk amounted to $9.72 and sales price per 100 lbs. ranged from $9 to $11.50.

Dairying, which accounts for more than 50 percent of the annual farm income, has seasonal surpluses, even in its developmental period. Surplus milk is sometimes sold below production costs in the Matanuska Valley, the largest production area.

Using the national average consumption rate of 107 lbs. of potatoes per person, 1,680 acres would be needed to satisfy requirements for Alaska's 220,000 people. The 1957 potato acreage for Alaska was 1,090 acres, 1958—1,008 acres. Planting indications this year are 730 acres—a steady downward trend reflecting high production costs, market price fluctuations, reduced demand by military forces, and competition from lower production cost areas in other States.

More adequate marketing facilities are a prime need to assist agricultural production in Alaska.

Agricultural financing is a problem in developing the State. A revolving loan fund initiated by the State legislature has been the backbone for financing available to farmers. To date, $400,000 has been appropriated for this fund, which is administered

(See Homesteaders, page 138)

FUTURE FOR LAND

(Continued from page 129)

The rest of the answer was supplied by the people themselves—at least the relatively few who were making a satisfactory adjustment to their new environment on old farms. By observing and studying the patterns set by these modern-day pioneers, extension workers learned that success is usually based on a two-fold approach.

One approach is the development of the land for its immediate gracious living and recreational values. This includes the family garden, the farm pond as the hub of many family activities, saddle horses, livestock limited to 4-H projects or to stock the freezer, and similar worthwhile pursuits that add to the family's enjoyment of life in the country.

At the same time, long-term projects focus on the development of natural resources not only for family recreation, but also for aesthetic improvements and future income possibilities. These include woodland utilization, reforestation and Christmas tree farming, wildlife management, soil and water conservation, and other land upgrading measures.

Prior to this extension program, the county's abandoned farmland changed hands on the average of once every 5 years, and 85 percent of the residents acquired their property through outright purchase. This unstable condition neither reflects harmonious rural living nor promotes sound community development.

Today the ownership rate of change is about 10 to 12 years. Significantly, business and industrial leaders, as members of extension committees, report greater stability in their work forces from rural nonfarm areas.

Broome County's land-use program is truly a cooperative effort. Relying on assistance from many agencies, it continues to plot a successful course with Extension at the helm. It combines strong local leadership and professional know-how with administrative and specialist backing from the State agriculture college. In addition, many segments of society take an active role in the program's development.

A recent example is the extension clinic for part-time farmers arranged through the personnel departments of several large industries. It is not unusual to find in the audience a good cross-section of rural nonfarm residents, part-time farmers, commercial farmers, sportsmen club representatives, businessmen, and even city people who are potential rural residents.

Every Broome County resident, it seems, has a personal stake in this land with a future.

FARM WOODLANDS

(Continued from page 124)

now routine achievement of 100 bushels of corn per acre was not a chance accomplishment. It took planning; it took education and demonstrations; it took decision making.

Likewise, we know that chance production from America's cut-over woodlands will not meet our timber needs. Before America's several million chance-production woodland ownerships can be converted to planned production, their owners will have to be motivated. They must be sold on the need to apply some simple forest management practices to their lands.

Extension's Place

Motivating 4½ million small forest owners is a tremendous task. However this job is especially tailored for extension workers. Extension foresters and the thousands of county extension workers can take the lead now and move forward. Many State extension directors are already in position to lead under written or verbal memoranda of understanding between them and State foresters.

Let's not forget the farm youngsters, particularly in 4-H. With a little stimulation and help, many will take an active interest in the farm woods.

Timber Resource Review facts are available for each State. These facts can be analyzed by extension workers as a basis for a local motivation action program.

Extension field workers are among the busiest people I know. And I do not propose that they be saddled with sizable forestry-motivating education and demonstration duties. But I do suggest that all extension workers, particularly those at the county level, ask the timberland owner at every opportunity, "What are your plans for your woods?"

Let's make known the available forestry services. If the farmer or other small forest owner shows an interest, let's acquaint him with the local forester. Then this local forester, who may be an extension, State, industrial, or consulting forester, can take it from there. As a regular part of your day-to-day work, this will go a long way toward making your county more prosperous and it will help assure quality timber to supply the nation's needs in the future.

THE BRANDYWINE

(Continued from page 131)

some of this water during flood periods and use it during periods of drought. This led to the comprehensive Water Supply and Flood Control Project for the Brandywine Valley.

Assistance on flood damage surveys was requested from the Soil Conservation Service. The State Department of Forests and Waters was asked to help determine present and future requirements for water supplies in the Valley.

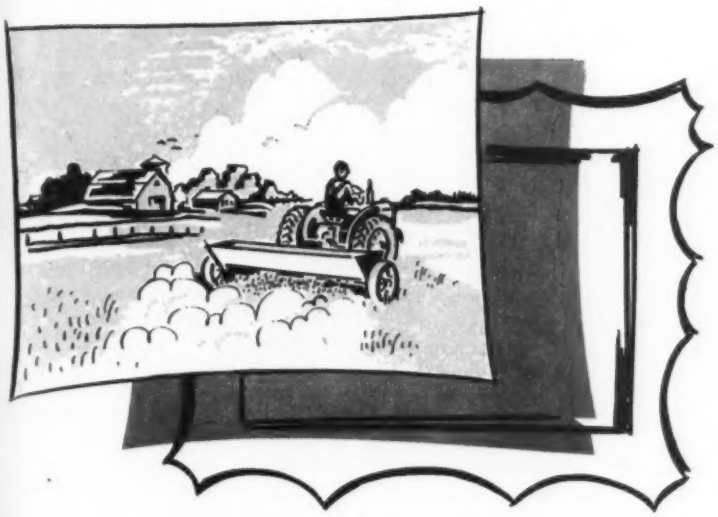
Surveys were soon extended to determine the structures necessary to establish a satisfactory degree of flood control and to provide for storage of water and downstream releases to meet the needs of community, industry, agriculture, and recreation for 50 years in the future.

This project will provide two things —flood protection and water supply. Flood protection will be provided to the extent of a reduction of 77 percent of the existing flood damages in the Valley. And it will assure 54 million gallons of new water supplies per day even for a 90-day period of drought.

Currently, progress is being made on this project on all fronts. Financial, legal, legislative and engineering details are being worked out.

When completed, this project will be one more important example of the power of people working together and the bentfits of constructive community action on a watershed basis.

Fitting Conservation into the picture



by E. R. DUNCAN and F. W. SCHALLER, *Extension Agronomists, Iowa*

LARGE shifts in land use are being made on individual Iowa farms. But the total acreage of major crops for the State has changed little. Marked increases have occurred in total crop production, mainly stemming from higher acre yields.

Gross character of land use changes can be drawn from acreage trends in major crops. Corn has heavily dominated the crop economy, with a generally constant figure of more than 9 million acres since 1900. Soybean acreage has climbed rapidly in the last 15 or so years, drawing most of its acreage from oats. Tame hay has held rather constant, but a sharp shift is underway toward replacing red clover with alfalfa.

Lime application has followed closely the payments through ACP cost-sharing. Fertilizer was little used before 1940 but is a major item now. Yet fertilizer tonnage follows the line of income from crops and livestock.

There are important markers already in view that may point to the future of land use in Iowa.

● Since World War II a new type of farmer has emerged in increasing numbers. He is a businessman in every sense—a manager, a researcher, a man who can combine know-how with money, through management. He increases volume and profit through opportunities he makes for himself. Efficiency is his byword—and he understands what it means!

What is the implication on land use when you consider this kind of farmer?

In Iowa, land has little alternative use but for crop production. It is different than labor or capital. If labor and capital don't return as much in agriculture as elsewhere, they tend to move out. This is not so for land, where there is no attractive alternate use.

The best land use in most such farmers' programs, then, will approach the system, which—over time—will give the greatest production of the most profitable crop. The concept of comparative and absolute advantage enter. In the present situation, Iowa—and perhaps much of the Corn Belt—has a comparative advantage in growing corn for grain. Any new technology must further enhance this advantage—or find reluctant acceptance.

● Another sign of the future is the increased attention to more intensive cropping of soils. Continuous cropping is a reality—not a debate topic—for many farmers of the kind mentioned above. Intensive cropping has real advantages:

1. A crop can be grown on a soil—even a field—where its advantage is greatest. This may mean, for example, that more level land goes into corn, with high-level capital and management poured into that crop.

2. Another alternative is provided which can enhance achievement of a greater degree of erosion control. Generally soils on slopes produce less grain but about as much forage as level soils. The row-crop—with its erosion hazard—tends to go on the flat, with the forage crop—the soil and water holder—on the slopes.

3. Intensive cropping means relatively less effort in seedbed preparation and less cost in seed. These add to net profit.

Problems Raised

Of course, there are disadvantages: Work will tend to pile up on either all level or all sloping land. Greater attention to weed, insect, and disease control is necessary. And more capital is needed to intensify crops—either grain or forage.

Soil conserving practices normally do not immediately increase income. This may mean that they do not rate at the top of the list with the businessman-farmer we are talking about. Society recognizes this fact, and society supplies money through cost-sharing as a way of safeguarding the future of the land.

A lot of effort has gone into soil and water conservation research. Many new practices are finding their way into efficient farming units. But there are two barriers to more rapid

(See Fitting In, page 142)

Step-By-Step to Soils Education

by G. R. EPPERSON, *Associate Extension Agronomist, Virginia*

IN childhood we learned the letters of the alphabet. Then we learned to arrange these letters into words, words into sentences, sentences into paragraphs. Through these processes, we also learned to read and interpret written material.

Most of the other phases of our education are developed in a somewhat similiar manner. We start with the simple or basic considerations and develop into the complex.

Starting Off Right

Since education is a building process, the educator must determine the level of education of the person to be trained and proceed from that point. Starting above the educational level results in confusion, discouragement and often disgust on the part of the trainee. If the educator begins at the proper level, the trainee develops greater interest and a desire to learn more about the subject.

The first consideration in wise soil use is a knowledge of the soil. This knowledge may be gained through determination and interpretation of soil characteristics, experience, or the trial and error method in soil use.

In our soils educational program with county agents, we start with the agents at their level of soils knowledge and build. And we attempt to help them see that the entire agricultural production of their county is built upon the soil and that success in production depends on wise use and management of the soil.

The best place to study or teach soils is in the field. The best method that we have used is examination of exposed cuts or cores removed by auger or digger. We discuss the observed characteristics and their meaning as related to soil use and management. It is impossible to identify and characterize soils and to decide suitable use and management for them while riding at 40 miles per hour across a county.

Let's see what happens on a 1-day soils training trip with a county agent and his assistants in a Southern Piedmont Virginia county.

Leaving the office, we drive a short distance to an area of soil occupying an undulating ridge top. Upon examination, we find a surface layer, about nine inches thick, of brownish-yellow, very friable fine sandy loam. It has slightly darker color in the upper two inches. We discuss the color and texture and interpret that this surface soil absorbs and transmits water readily, will work easily, warms up early in the spring, etc.

The next layer, about four inches thick, is yellowish-red to red, firm heavy clay loam with medium blocky structure. Below this we find a layer about 25 inches thick of red firm clay containing some small mica flakes. Interpreting what we have seen in the subsoil, we note that the heavy clay loam to clay retains moisture and plant nutrients well, the soil is well drained, and it has sufficient depth for all crops grown in the county.

Summarizing, we have a Cecil fine sandy loam, undulating slope, that has a wide range of suitability for crop production. Although not the best soil in the county for flue tobacco, it is good for that crop, as well as grain, hay, and all crops grown in the county.

This soil is easy to till and has good conservability. Fertility is normally low and reaction strongly to moderately acid but it responds readily to good management.

Hidden Differences

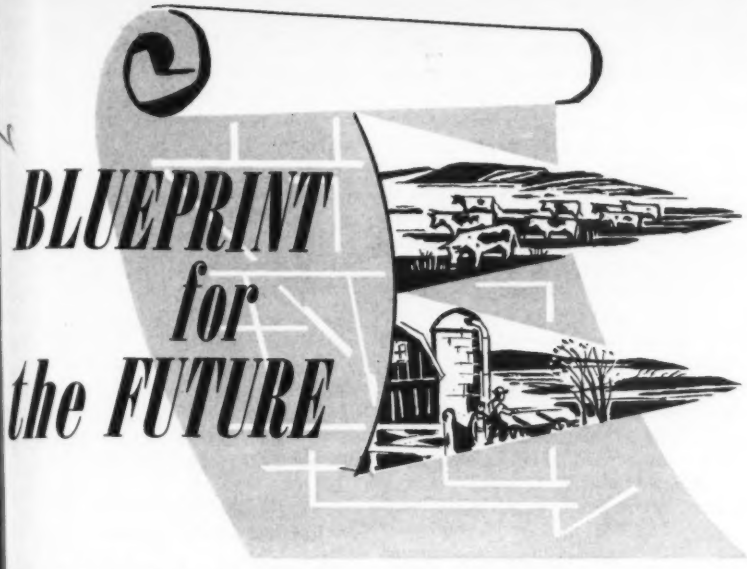
After traveling a short distance, we stop at an area of soil that has much the same general surface appearance as our first location. Examination reveals that it has about 12 inches of surface soil with a yellowish-brown very friable fine sandy loam surface. The upper subsoil is yellowish-brown and the lower is yellowish-red firm clay loam with medium blocky structure.

At a depth of about 36 inches, the soil becomes yellowish-red mottled with brown and yellow, and contains numerous mica flakes and quartz particles. Interpreting, we have an Appling fine sandy loam, undulating phase.

Comparing it to the Cecil fine sandy loam, we find that Appling

(See Soils Education, page 143)

Reading and interpreting soils maps are important steps in a soils training program.



by F. V. BURCALOW, *Agronomist, and* G. M. WERNER, *Dairy Specialist, Wisconsin*

AMERICA'S farmers have the responsibility of providing food and fiber for our rapidly expanding population. And they have another obligation—to conserve the soil, our greatest natural resource.

Each generation is responsible for turning resources over to the succeeding generation in better condition than when received. But even a cursory examination of history shows us that soil resources have often been considered expendable.

In Wisconsin, dairy and livestock account for nearly 90 percent of farm income. Feed, which represents 50 to 60 percent of the cost of milk production, offers one of the best opportunities for cutting costs.

Grassland farming means following a good land use program which results in low-cost feed production and, at the same time, conserves the soil. The program in Wisconsin is built around an increased acreage of grass-legume mixtures used for pasture, green feed, hay, and silage. It also includes cultural practices leading to efficient production of small grain and corn when these crops fit in the rotation.

This is a program fitted to Wisconsin soil and climatic conditions. It is basic to successful livestock production because it helps to hold down the cost of producing meat and milk.

For many years Wisconsin farmers have had an annual purchased feed bill of over $100 million. This could be greatly reduced if we did a better job of producing, harvesting, storing, and using forages. If we could save and use all the protein produced on the 4 million acres of hay land in Wisconsin, we could cut purchased protein concentrate requirements for our dairy herds to practically nothing.

In haying, leaf loss alone accounts for heavy nutrient losses. For instance, it is possible in putting up an acre of alfalfa hay to lose in leaves alone the equivalent in protein and total digestible nutrients (TDN) of 800 lbs. of linseed meal and 450 lbs. of corn and cob meal. Grass silage, mow curing, green feeding, controlled grazing, conditioning, and crushing materially reduce these heavy nutrient losses.

Efficient production, harvesting, storage, and utilization of increasing supplies of forage is the aim and responsibility of everyone working on the grassland farming project. This program, if it is to be successful, requires the combined efforts of people in agronomy, soils, agricultural engineering, agricultural journalism, and agricultural economics as well as those in dairy and animal husbandry and related groups.

Improvement Plans

The overall goal is the production of abundant supplies of high quality, low cost feed from an increased acreage of well managed forage crops, along with a land use program tailored to individual farms. In this program, conserving the soil becomes one of the important results of good farming practices.

In cooperation with foresters, we are trying to take cows out of the woods. Renovation of open permanent pasture on better soils will increase total feed supplies so that several million acres of woods pasture can be placed under good timber management.

Production per acre of renovated and cropland pasture is being increased not only by better fertilization, but also better grazing management, such as controlled strip grazing. Supplemental pastures, like sudan grass, are filling in weak periods in a season-long pasture program.

Pasture planning calls for the use of grass silage or possible seed production to utilize seasonal surplus pasturage. On many farms, top quality pasture provides the lowest cost per pound of TDN of any feed that can be offered our cattle.

Quality, as related to stage of maturity when harvested, is being stressed in the production of hay, grass silage, and green feed. The importance of saving the leaves in making hay is also stressed. Use of recommended varieties and mixtures adapted for the various soil and disease conditions is a part of the forage production program.

Increased rates of fertilizer, surface drainage, and other management practices that provide greater longevity of stands are being recommended for maximum as well as low-cost production. In most instances, the longer that productive stands can be maintained, the lower the cost per pound of TDN produced. Management and fertilizing practices for the establishment as well as the

(See Blueprint, page 139)

FISH AND WILDLIFE

(Continued from page 127)

closely coordinated, fully cooperative approach to resource problems is emphasized by the interrelationship of these resources and the vital need to achieve maximum effectiveness in the activities of our individual agencies.

This basic necessity for interrelated resource activity is reflected in recent moves toward closer cooperation between Departments of Interior and Agriculture in developing new answers to meet the problems of the future. There has to be such a partnership effort, for our problems are inseparable.

Educating the Public

No natural resource management program, whether related to soil, water, forests, or fish and wildlife, can be realized unless the public endorses and applies it. The public must understand what our professional fish and wildlife people are doing, why they are doing it, and how citizens can participate in and make a reality of such a conservation program.

Conservation education, then, may be aptly termed a "favorable public state of mind." Conservation education, however, is not a job a single agency can do by itself. Rather, it is a responsibility to be discharged by all departments and organizations —both government and private— concerned with the management of these resources.

Each one must make certain its part of the conservation program is understood. When you have this complete public understanding, you also insure proper balance in the total program.

HOMESTEADERS

(Continued from page 133)

by the State Department of Agriculture.

Farmers Home Administration loan facilities are available but limited by the majority of new settlers' inability to meet minimum security requirements.

Climatic features differ in Alaska's major agricultural areas, producing unusual problems. Low soil temperatures in the Tanana Valley (Fairbanks), Matanuska Valley, and Kenai Peninsula slow up decomposition of organic materials.

Interior Alaska, with winter temerature often dropping below —50° F., has severe permafrost conditions in many areas. These conditions hamper surface and sub-surface drainage and result in a lag of 2 to 3 years from clearing action to time the land may be worked.

Growing seasons are short and feature frost hazards—both items of importance.

The majority of Alaska homesteaders depend on off-farm employment to provide a living and farm development funds. Average development periods from initial entry to the beginning of commercial production range from 5 to 8 years.

Military construction, base maintenance, supplies, and payrolls have accounted for more than half of the total income to Alaska since World War II. The demand for persons with building trade skill, administrative experience, and maintenance work is strong. This work, especially the construction phases, is highly seasonal. Mining is a minor resource at present.

Living costs are high in Alaska. A December 1958 food price survey indicated higher prices in 40 major retail food items. Palmer and Anchorage averaged 135 and 136 percent over Seattle, Wash. prices. Fairbanks, the highest cost of living area of agricultural importance, averaged 152 percent over Seattle prices.

On the Plus Side

What justifies continued emphasis in developing Alaska's agriculture? There are several large areas of fairly good soils where climates favor cool-season crops and forage.

Cereals will mature and even tomatoes will ripen in the short summers in the Yukon Valley. Farther south, near Fairbanks, the frost-free period is sufficient for cereals and forage, although summer temperatures are generally too low for warm-season vegetables such as beans and tomatoes.

The coastal climate of the Kena Peninsula is marked by longer fros free seasons but also by lower sum mer temperatures which preven cereals from ripening except in fa vorable years. Forage thrives in thi environment, which is well adapte to dairying based on high protei silage feeds. Cool-season vegetable and potatoes grow well.

Agriculture in Alaska, a bulleti for prospective settlers, contains in formation on prospects and problem of specific agricultural areas i Alaska. It may be obtained fro the Director of Agriculture Exper ment Stations and Extension, Bo E, Palmer, Alaska or University o Alaska Extension Service, Box B, Co lege, Alaska.

PUBLIC DOMAIN

(Continued from page 126)

and promoting the most effecti use of all the public lands, BL range management personnel assi in coordinating grazing activities o a complex pattern of intermixe Federal, State, and private land The Bureau also conducts a rang improvement program in cooper tion with stockmen, including rang seeding, noxious weed control, an the construction of truck trails, co rals, fences, and watering facilities

Big Business Receipts

The increasing use, importanc and values of the Nation's publi lands and resources are reflected i last year's operations of the Bureau of Land Management.

Receipts from the lease, sale, an management of public lands an resources in 1958 set an all-tim record of about $124 million. BL also received $3.4 million in ren and royalties from mineral leasin on the Outer Continental Shel bringing gross receipts for the yea to a rounded total of $127.4 millio

Total receipts by the Bureau o Land Management since its creatio in 1946 now have rolled over the $ billion mark.

This giant-size operation, whic grew from the 1812 General Lan Office, is standing guard over ou public lands and resources—the conservation and management.

Seeing is about ha

The Team Approach to Forage Education

by LEYTON V. NELSON, *Farm Crops Specialist, Michigan*

FARMERS know more about using grass to conserve soil and water than they do about conserving grass itself. This prompts many questions about utilizing forage more efficiently, conveniently, and profitably.

Though there is much information on grass to answer some of the questions, it comes from separate fields. So it is difficult for a farmer, or anyone else, to relate the developments in forage production, forage machinery, and nutrition to a specific farm situation.

To add to the confusion, some recommendations seem to conflict. Take time-of-cutting hay as an example. The dairy specialist likes hay harvested young for high quality, while the crops specialist suggests delaying hay harvest until early bloom for greater quantity. The farmer has to reconcile these recommendations —both of which may be right.

For several years, Michigan specialists in dairy, animal husbandry, agricultural engineering, soil science, and farm crops conducted Winter Grass Institutes in a team approach to forage education work. These all-day meetings consisted of a series of talks on soils, forage crops and management, agricultural engineering, dairy and other livestock. The program concluded with a slide summary and discussion of the meeting highlights.

Seeing is believing. Farmers learn facts about hay quality from Dairy Specialist Don Hillman.

Suiting the Audience

Farmers often said the summary was the best part of the program. After this experience, the Hay and Pasture Institute meetings were set up to present forage information with a topic approach rather than department-by-department. These were held on a several county area basis during the winters of 1958 and 1959.

Here is the difference. Instead of a program with separate talks on soils, crops, equipment, and feeding, subject matter was tied to topics such as forage quality, what it is, etc. Topics were chosen on the basis of questions in previous meetings.

Audience interest was due largely to the way the program was arranged and conducted. At times, nearly every person in an audience of 150 or more entered into the discussion before the day was over.

Using Panel Talks

Each program opened with a panel discussion by well-known farmers. This proved an excellent technique as it gave the program a local flavor and encouraged discussion. The panels were always good when they: had 3 or 4 participants, were county agent moderated, were arranged in time for local publicity, were clearly defined as to assignments of panel members, and were arranged so each member discussed a separate topic.

Each panelist's discussion dealt with his experience with a particular method, new crop or new equipment. Some topics were: preservation for grass silage, green chopping, spittle bug control, weed control, mow drying and pelletized hay.

Then, using the same panel approach, specialists discussed general topics. First, they attacked the question of forage quality. Why grow and feed quality forage? What is it? How do you get it? For example, machinery was discussed as it fits into a quality-forage system, not just as equipment. And special attention was given to "fitting a system to your farm."

Additional discussion dealt with hay and silage management, growing, harvesting, and feeding; pasture management systems; and progress reports on developments in bloat control, minerals, antibiotics, parasite control, and estrogens.

The Hay and Pasture Institutes in 1958 and 1959 were the most successful winter forage meetings held in Michigan in recent years. Farmers got new ideas and answers to some of their most pressing forage problems. And the specialists, in planning and working together, developed a better integrated forage education program.

BLUEPRINT

(Continued from page 137)

maintenance of stands are advocated.

Harvesting and storage methods that result in saving the greatest amount of feed nutrients per acre are important. It is poor business to grow top quality crops if one-third to one-half the feed value is wasted in harvesting and storage.

We have a program of chemical analysis of forage, in addition to evaluation of score cards, as another helpful step in balancing the supplemental feeding program on the basis of forage quality. Forage clinics, where farmers bring in samples of hay and silage for evaluations, also help promote the quality forage program.

We think grassland farming is "A Blueprint for Wisconsin Agriculture."

Conservation Comes to the City

by ROBERT D. BUCK and HERBERT C. GUNDELL, *Denver County Agents, Colorado*

If anyone had suggested a 4-H conservation project in a large city 4-H Club program a decade ago, the idea would have caused some casual smiles. But the smiles might have turned quickly to looks of surprise. In only 8 years, conservation has become one of the most widely recognized 4-H Club projects in Denver.

Denver is a city and a county. The boundaries of both are identical. It is a mile above sea level, at the foot of the Rocky Mountains, and is the gateway to one of the greatest outdoor sports and recreation areas in the nation. Naturally, conservation is a meaningful way of life in this area.

During the mid '50s, the Denver area experienced one of its worst drouths. Suddenly, with the great need for intelligent use of water and native grasses, conservation became a subject of keen interest. 4-H conservation clubs sprang up all over the city.

Sparked by Demonstration

A 4-H team demonstration in conservation sparked the interest. Two older club members worked out a top demonstration in conservation and won county, regional, and State honors. They became a sought-after educational feature at national conservation meetings.

Much credit for the conservation project's success goes to Dr. K. E. Oberholtzer, superintendent of Denver public schools. Dr. Oberholtzer, a former county agent, arranged for team members to present their demonstration in all junior and senior high schools of the city.

When the first conservation clubs started, we had little help. 4-H conservation manuals and record books were not suitable for urban 4-H Club conditions. Through the cooperation of State specialists, however, the manuals and record books were revised. Then conservation became an exciting project for Denver boys and girls.

More than 400 boys and girls are now enrolled in Denver County conservation projects, with a promise of more. Many clubs are in the Denver public schools where teachers have assumed the important leadership. They think the projects are excellent.

Each school club has its own officers, carries out its own program, and has its own recreational opportunities. Club members may choose from many different activities to complete their project work.

There are three requirements for completion. One is a talk on conservation. The talks are generally not over two minutes long and may deal with any conservation subject.

The second requirement is a scrapbook on birds and wildlife, soil conservation, trees, grass, or fish. An alternative is a display of six different Colorado soil samples with descriptive information gathered by the members. Or it may be a display on contour farming, strip cropping, forrests and fire protection, or soil erosion. Club members may elect to do a demonstration as another option in this requirement.

The third requirement is a story written by the 4-H member on, What I Have Learned In My Conservation Project.

4-H leaders in conservation are well-supplied with teaching aids. Audio-visual materials are available from the county extension office, Colorado State University, Denver Public Schools film library, and Colorado Game and Fish Department. Other materials include bulletins and pamphlets from the University, USDA Forest Service, Soil Conservation Service, and U. S. Fish and Wildlife Service.

The clubs often have an outside speaker. These may be extension agents as well as representatives of the State Game and Fish Department, SCS, Fish and Wildlife Service.

Club Backing

Awards are part of the 4-H conservation project, too. A service club sponsors special awards for some large clubs. The service club also entertains boys and girls who are outstanding in conservation projects.

The project would be difficult to maintain without the full cooperation of many people and agencies. They have made 4-H conservation a meaningful project. They recognize it as an opportunity to make better citizens for tomorrow.

Seedling trees from the State nursery will be planted in a windbreak by Denver 4-H Club Conservation members.

Range Management Is on the Up-Swing

by KARL G. PARKER, *Range Specialist, Montana*

EXPLAIN and demonstrate the basic principles of range management to ranchers. This is in keeping with the idea of helping people to help themselves.

Maintenance of our vital range, pasture, and watershed resources depends in great measure on how well the people managing the resource understand the principles of efficient management. The art and science of grazing land management is new. There is much "catching up" to be done.

Decision making in choosing a range practice or management system is more efficient if the rancher is familiar with the underlying principles of range ecology, plant physiology, climatology, soils, and animal husbandry. We use demonstrations to show range operators the practical application of these principles and improved management practices.

Progress in range extension work in Montana reached new heights in 1958. Extension range activities and accomplishments reported by county agents were double that of any previous year. Attendance at meetings and range tours as well as the number of range publications distributed were greater than in any previous year.

Last year's 4-H enrollments in the range management project—another good barometer — increased 44 percent over the previous year. This was the largest percentage increase of any established 4-H project in the State.

We carry on a continuing educational program which stresses: basic principles of grazing land management, personnel and leadership training, range condition and sites as the basis for native range management, better production through improved practices, timely marketing of livestock to conserve the range resource and avoid livestock weight loss, and grazing management for improved nutritional levels.

The first step in teaching basic range principles is for the county agents to understand the importance of the range resources. Background information during the last 2 years has called attention to the importance of certain natural economic and social resources. So agents realize the dependence of their people on grassland resources.

A 5-year 4-H Club project with a complete set of literature has been developed over a period of time.

Range Is Classroom

Teaching methods and materials for youth groups and their leaders are carefully chosen to convey the most meaning in understandable terms. As far as possible, we use the open range as a classroom.

Briefly stated, the following principles are stressed in the range educational program.

1. The roots of plants depend on the shoots for food and building material. The health of the soil in turn depends upon the binding influence of the roots as well as the conditioning of the soil for speedy absorption of water. Plant litter on the surface reduces excessive evaporation of moisture needed for plant growth and to feed the streams on our vital watersheds.

2. Nature is always trying to develop top condition range. If the plant cover deteriorates, nature tries to put back what she had on the land in the first place. Range in top condition is productive as well as efficient in conserving soil and water resources.

3. The principal factor that limits production on grasslands is the water supply. Range in top condition receives, absorbs, and stores moisture for plant growth, releasing the excess in an orderly flow into the natural water courses.

4. The health of the range plant cover and the underlying soil affect the health of the animals depending upon it.

Through our range educational program, we are helping ranchers to conserve, develop, and wisely use our vital range resources.

The range is the classroom on this 4-H pack trip in Rosebud County, Mont. Trained volunteer leader shows how certain plants are more effective in producing feed and conserving soil and water.

OUR RESPONSIBILITY

(Continued from page 123)

complicated and more pressing, and people in general become more competitive in their desire to use resources.

Water use is an example of the growing tenseness and competitive attitude among people. In some States there is intense competition for water among industrial, domestic and agricultural users.

Conservation, development, and wise use of natural resources is a component of every area of our responsibility in Extension. Efficient agricultural production implies the wise use of resources. Misuse of soil and water can lead only to greater cost and less efficient production in the long run.

Navigation and industrial water use relate to efficiency in marketing, distribution, and utilization of production. Visits to national parks, hunting, fishing, and enjoying the great outdoors are part of family living.

Involving Youth

Community improvement ties in with youth development, giving opportunities to use our natural resources for recreation and character building among young people. Competitive issues in resource use can be settled equitably when public policy education helps create proper understanding.

Extension has contributed materially to resource management and conservation. In 1957, 600,000 boys and girls were enrolled in 4-H projects relating to natural resources. Two million farmers were assisted in soil and water conservation practices. More than 600,000 were helped in forestry management. Cooperative programs with Soil Conservation Districts, Agricultural Stabilization and Conservation, Forest Service, State Game and Fish Departments, and related groups have resulted in better understanding and use of natural resources.

Extension's principal interest lies in helping people understand and appreciate the true value of using resources wisely. People must understand resource limits, effective uses, and needs for the present and for the future.

Most of the natural resource inventory is controlled and managed by farm families. The major share of our efforts probably will be working with and developing leadership among these farm and ranch families.

Extension prides itself in development of leadership. The field of natural resources has many volunteer leaders whose enthusiasm for their work has few equals. This kind of leadership can be readily expanded.

Spreading the Word

Other publics and groups of cooperators have interest in this area. They include rural nonfarm residents, public and private agencies and organizations, as well as urban families.

We are in a unique position to work with the many agencies and organizations that have specific responsibilities in the various resource fields. These include governmental agencies at county, State, and national levels. Our close link with the research arm of the land-grant college system provides a ready source of information on natural resource problems.

Extension now has specialists trained in the resource management field. But their numbers are limited. More training to deal with resource management is needed.

Because of the interrelationship of this area with the other eight in our scope and responsibility, those assigned to specific natural resource areas cannot accomplish the objectives alone. All extension staff members must make the conservation, development, and wise use of natural resources a part of their program.

FITTING IN

(Continued from page 135)

adoption: One is a reluctance to change what appears to be a satisfactory procedure. Two, most farmers tend to highly discount future returns—they want results this year!

Adoption of soil conserving practices is as simple and straightforward as for new varieties, insecticides, or fertilizers. *They will be applied when they are necessary to keep yields at a profitable level in any given year.*

Iowa farmers still average well below their most profitable crop yields. For example, many soils do not get fertilizer and lime where they could be applied profitably. The reason, probably, is that some of these soils still produce profitable, but not most profitable, yields without fertilizer or lime.

The Iowa farmer is independent and he values his independence. Profit is not his only—nor necessarily his ultimate—goal. He tends to farm less well than he could. His life and his business are more complex than a simple formula of cost-return representing a certain technological advance.

As professional workers we must recognize that the true value and return from a practice can be determined only when it is fitted into the complex framework that is the individual and his farm business.

SOIL ASSETS

(Continued from page 125)

veyed and that information can be used for this purpose. But this inventory will give us for the first time an overall picture for the nation.

Probably no one person will think of all the possible uses for this inventory. For example, it should be possible to estimate the runoff for any given watershed if we apply hydrological information to land use patterns for the soils involved.

County extension workers will find this information valuable in determining educational needs and in program planning for wise land use and conservation of soil and water. It should help in developing short and long-time goals. It should help establish priorities in conservation education work.

The results of this survey will be the massed opinion of more than 30,000 people in 3,000 counties. It will be what they believe is the present situation and the land use trend in this country.

The inventory should aid in development of programs that will bring about needed agricultural adjustments for wise land use and the conservation of our soil and water.

SOILS EDUCATION

(Continued from page 136)

is better suited to flue tobacco, vegetables, melons, sweet potatoes, and peaches. It is not as well suited to alfalfa, other hay crops, pasture and grains as the Cecil soil.

Appling soil is strongly acid in reaction, fertility is low, but response to treatment is good. However, this soil retains water and plant nutrients to a lesser degree than the Cecil soil.

Our next stop is down slope a short distance. Here we examine a soil that differs from the Appling fine sandy loam chiefly by having a yellowish-brown friable sandy clay loam subsoil. This is a Durham fine sandy loam, undulating phase.

In our discussion, we bring out that this is one of the best flue tobacco soils in the county and it is good for vegetables. Because of moderately low water and nutrient holding capacity, it is only fair to poor for grain, hay, and pasture crops.

On we go throughout the day, examining each soil carefully, characterizing it rather completely, and setting forth crop suitability and management needs. After we have studied two or three soils, it is easy to make comparisons and contrasts. These comparisons and contrasts include not only characteristics, suitability, and management needs of the soils, but parent material effects and other observable differences.

Soil monoliths provide opportunities for detailed study of soil.

Through these efforts in soils education, we do not expect to make soil scientists of county agents. We only hope to help them to gain knowledge of and appreciation for the soil that will enable them to render greater service to the people of their counties.

URBAN SPRAWL

(Continued from page 128)

prevent waste and inefficient use of resources, both human and natural. Zoning provides one tool whereby local people can plan for the orderly and systematic development of their community.

In areas where several dwelling units, and perhaps an industrial plant, replace one or two farm families, the increased demand for water alone can create a serious problem. By its public nature, this problem may well require attention on a broad rather than a local scale. In some cases the approach may have to be on a watershed basis.

Sharing Problems

The expansion of residential and industrial building into areas outside urban boundaries poses the question of what to do with forest lands. Shall we cut away the trees to make room for buildings? Shall we set aside certain forest lands as permanent preserves for recreational purposes? Shall we try to hold certain forested areas to supply needed timber for industry?

The greater demands for water, brought on by increased population, prompt the setting up of large water storage areas or reservoirs. A real problem, with water draining into these reservoirs, is one of siltation. And one of the best controls for siltation is reforestation.

A serious long-range problem is to maintain a desirable balance between open country land uses and urban type uses within local areas. This problem can be seen in abstract, but how does a community solve it?

We must remember also that we are moving rapidly into a more complex society where the uses of land and the interests of people are far more complicated and call for far more group action than ever before.

This whole, vast area of how to meet the problems of urbanization and conservation is one which calls for much planning on all levels—county, State, regional, or even national or international. The latter is illustrated by various developments around the Great Lakes. The main point is that developments on the local level may be influenced by circumstances which relate to a much larger geographic area or "community" of interest.

Activities relating to the problems of community development arise from various public agencies, from civic groups, private business, and individuals. To evaluate all this involves investigation and research. It certainly involves people with various interests getting together with the specific intention of pooling their interests for the common good. Extension has a vital part to play in such endeavors.

The agricultural interests of our country, including Extension, have an immense opportunity for leadership and a substantial responsibility for keeping the agricultural segment of our economy in step with our economy in general. Our goal should be to maintain a vigorous and prosperous agriculture under conditions in which our economy in general is fast becoming urban-industrial in nature.

Monthly Revisions in Publications Inventory

The following new titles should be added to the Annual Inventory List of USDA Popular Publications. Bulletins that have been replaced should be discarded. **Bulk supplies of publications may be obtained under the procedure set up by your publication distribution officer.**

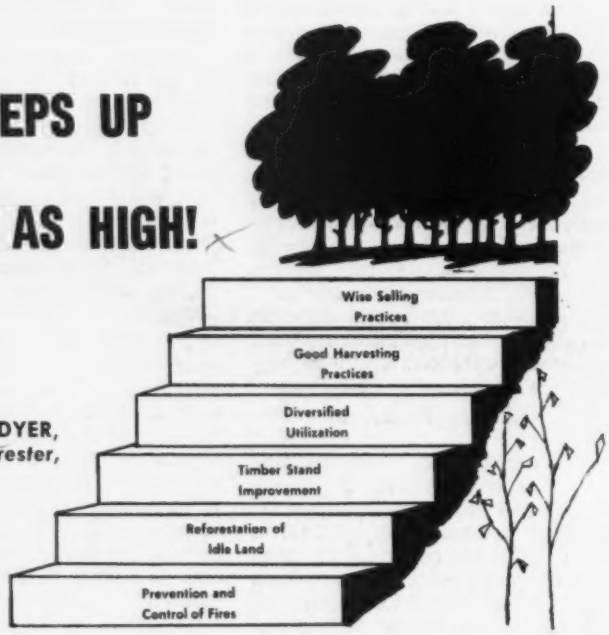
F 1787	Internal Parasites of Swine—*Revision 1959*
F 2130	Rope on the Farm—*New*
L 116	Growing the Jerusalem Artichoke—*Slight Revision 1959*
L 268	Eat a Good Breakfast to Start a Good Day—*Revision 1959*
L 446	Filters and Screens for Irrigation Wells—*New*

GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON 25, D. C.

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300
(GPO)

SIX STEPS UP AND TWICE AS HIGH!



by
C. DORSEY DYER,
Extension Forester, Georgia

FOREST conservation is a high-sounding phrase with an altruistic ring. It has been used many times with farmer, civic, youth, and other groups remotely interested in the great outdoors.

To many people, the word conservation doesn't give the proper implication. Conservation, when used in connection with forestry, implies preserving, guarding, defending, and keeping safe the trees of the forest.

The great need in forestry today is for more intensive management in more woods. Many people think of conservation as what nature can do —management is what man can do. Nature has done real well—now it's man's move.

In Georgia, the forest acreage is producing at less than one-half capacity. The woods in most other States are doing little better on the privately-owned areas. We're not satisfied with half production, and we think the only answer is more forest management—complete and intensive management programs.

Some farmers reforest idle acres, some practice fire prevention, and others do a little timber stand improvement. Most fail to carry out a complete management program, for they haven't had such a program in mind or at hand.

The good dairy farmer follows a complete dairy management program, and his cows give more milk. A corn farmer follows a complete corn program, and he doubles his yields. The same idea will work in the woods.

Georgia extension workers have developed a six-step forest management program which we believe to be complete. The program has had wide acceptance, and the landowners seem glad to learn the steps to a complete woodland management program. (Illustrated at left.)

The six-step campaign was launched at the Rock Eagle 4-H Club Center last October, with an attendance of more than 900 people representing practically every Georgia county. This was probably the largest forestry meeting ever held in the State.

The program is now being launched in the counties with the theme, Six Steps Up and Twice as High! This theme is based on the half-production mentioned and the fact that a complete management program can double timber values.

Shouldering the Job

Extension has a great opportunity and responsibility in the conservation of natural resources. The Soil Report indicates that we are aware of and willingly accept the responsibility.

In my 20 years of service, there has never been a time when farmers and the general public were as interested in forest conservation as at present. The time is right for the initiation of genuine, active forest management programs.

By the same token, the time is right for all of us to quit hammering forestry practices one step at a time. Farmers do more planning now than they once did, and they plan further ahead.

Let's give them a complete forest management program for more profitable timber production and more conservation of trees, soil, water, and wildlife.

E TO AVOID
E, $300

rkers have
st manage
believe to
n has had
landowner
steps to a
gement pro
.)
aign wa
le 4-H Club
an attend
people rep
ry Georgia
the larges
eld in th

ng launche
theme, &
High! Thi
half-produc
fact that
rogram c

Job

opportuni
e conserva
The Sco
e are awa
the respo

ervice, the
hen farme
ere as inte
ation as
ght for th
ctive fore

the time
hammeri
ep at a ti
ng now th
plan furth

mplete fore
or more pr
n and m
l, water, a